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Original Communications.

EXTRA-UTERINE PREGNANCY.

By T. C. LAWTON, M.D., Cranston, R. I.

MRS. E. was married, at the age of 22 years, in 1831; became pregnant for the first and only time in 1841, and expected to be confined in July, 1842. Previous to pregnancy, she had always enjoyed good health.

During the first seven months of gestation she was sick all the time, having spasms every month, and at the time when the menses should have appeared. The first two or three paroxysms were so severe that her life was despaired of, and for three months of the seven she was confined to her bed. For the last two months, there was no recurrence of the spasms, and her health was much better. About the seventh month she felt an uncommonly active movement of the foetus, which, as she expressed it, ended in a grand flopping over and falling backwards and to the right side. After this, she felt but very slight if any motion. A short time before her expected confinement, she received quite a jar, by jumping from a carriage, and of this she always complained, and referred her subsequent trouble to it.

At the expiration of the ninth month, she was taken with labor pains, accompanied by a considerable show. As these increased, she took a dose of morphine, after which they ceased, and never returned, although her physician, the late Dr. Fearing, did all that he could to bring them back. The discharge continued for ten days or a fortnight, during which time the size of the abdomen considerably diminished and the foetus settled down considerably lower. She was soon about, but for more than a year her health was very poor, and she was unable to walk without great difficulty, besides being very low spirited. After that time, she began to improve and to enjoy her usual good health, but she was always troubled with a lameness and a difficulty in getting into or out of a carriage. The menses came on after the threatening of labor, and she continued regular for ten or twelve years. The foetus always troubled her more or less. Besides the weight, she always felt a sensation of coldness, and sometimes more or less soreness, in the right iliac and hypogastric regions, and she was troubled with prolapsus uteri for a year or

more after. She is said to have had, during the following summer, an attack of inflammation of the bowels, which was very severe, and was probably peritoneal. She was troubled with erysipelas, more or less, in subsequent years.

I first saw her, professionally, Dec. 14th, 1869, and saw her occasionally from that time until the June following. When first called, I found her suffering very much from dyspnoea (apparently asthmatical) and from severe pain in the stomach and bowels, with nausea, but no vomiting. Her account of the attack was as follows:—Had felt as well as usual through the day. About 4, P.M., ate a hearty dinner of baked fresh pork and beans. Soon after, started to ride to Olneyville. While getting into the carriage, she felt this tumor, which she said was a child (and which I did not believe), tip over from the right to the left side. The pain and dyspnoea came on soon after. She rode about a mile, and turned back home. She was relieved by an emetic, followed by anodynes. The tumor was in the lower part of the abdomen, to the left of the median line, supposed to be a fibrous growth. For several months after this, she suffered more or less from dyspnoea and dizziness, and from soreness in the left iliac and hypogastric regions. She was unable to walk much, on account of the shortness of breath and the soreness low down in the abdomen, but rode a great deal. Much of the time she could not lie down. She was a very active and resolute lady, and could not be kept still when she could possibly be moving about.

From June, 1870, to May, 1871, she was not my patient, but she was always doctoring, and ready to try anything and everything that was recommended to her. The only regular practitioner who treated her during this time, so far as I know, was Dr. Peckham, of Providence, R. I.

May 21st, 1871, I was again called, and attended her until her death. I found her a good deal emaciated, very weak, with shortness of breath, the dyspnoea much aggravated by exertion or talking. She had anasarca of the lower extremities and of the abdominal walls. I could not detect any accumulation of fluid within the abdominal cavity. The lower extremities became very much swollen, and were punctured extensively with a lancet. By this means, large quantities of water (probably several gallons) were got rid of, the swelling of the abdominal walls almost entirely disappearing, and that of the limbs being greatly diminished. She continued in much the same way, failing slowly, until about a fortnight before she died, when erysipelas set in. A large blister, which appeared on the right leg, constantly extended, and the other leg was soon in the same condition. Before her death, the right limb, from the heel to the middle of the thigh, was one continuous erysipelatous sore, and the left was nearly as bad. She died July 17th, 1871, aged 62 years, and twenty-nine years after her expected confinement.

July 18th, assisted by Dr. C. T. Gardner, I made a *post-mortem* exa-

mination, in the presence of Drs. Peckham, Perry, Remick, Browning, and others. The foetus, with the uterus and a portion of the membranes that were attached, weighed  $4\frac{1}{2}$  pounds. It was found in the epigastric region, to the left of the median line, attached slightly to the left ovary, and was not contained in a sac; lying back of the small intestines and bladder, and anterior to the womb. No trace of a placenta. Old peritoneal adhesions quite extensive. Organs of abdomen and thorax in a normal condition.

The foetus having been dried, the head and trunk appear to be sufficiently well developed, as are the extremities for the most part. The right upper extremity crosses and is pressed firmly upon the front of the chest. A thick and indistinct mass is seen in place of the left hand; a large part of the humerus is quite denuded, and it is the only bone that is not perfectly covered; and from the forearm there hangs off something, which may be the uterus. Right lower extremity strongly flexed upon the body, and the leg very strongly upon the thigh, the foot forming an indistinct mass, not unlike the left hand. The left stands off from the body, and the foot is very strongly bent against the leg. From the lower part of the body there hangs off a large piece of membrane that resembles the omentum.

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#### THE TREATMENT OF ERYSIPELAS.

By DR. V. KACZOROWSKI.

Translated for the Journal from the *Berliner Klin. Wochenschrift*, Dec. 30, 1872,  
by E. WIGGLESWORTH, Jr., M.D.

DURING the last three months so many cases of erysipelas have occurred here in Posen, that we are justified in speaking of an epidemic of this disease.

The same has occurred in other large cities, especially in Berlin.

The malady, especially in advanced cases, has been characterized by a marked intensity in the nature of the symptoms, excessive dermatitis, with mortification of the skin of whole limbs, and a tendency to spread over the entire surface of the body.

The object of the physician has always been to interpose a barrier to the progress of the inflammation outwards from its starting point, since this progress gauges the injurious effects of the disease.

The following remedies, arranged according to their value—nitrate of silver, collodion, oil of turpentine, cold, tar—do not, unfortunately, always suffice, and erysipelas is only too common, in the case of many people, after even apparently slight injuries or operations.

Since the disinfecting properties of carbolic acid have become more thoroughly recognized, I have instituted a series of experiments, extending over the last two years, with regard to the action of this agent in cases of this disease, basing my anticipations of a

favorable result upon my belief that erysipelas is an infectious disease, dependent upon the presence of micrococci, a belief justified by the concurrent testimony of the investigations of von Recklinghausen, Waldeyer, Hueter, Klebs and Orth.

The results of these experiments have been extremely favorable, almost without an exception.

Appreciating the deceptiveness, as a rule, of infallible remedies, and the consequent disappointment of the practical physician, I have refrained from the publication of my method of treatment so long as my observed cases were few in number. But the extended opportunities of investigation offered me in the hospitals during the last few months, both as to number of cases and severity of symptoms, have confirmed my beliefs, and warrant their introduction to the medical public.

My colleague, Dr. Samter, who has charge of the female wards of the City Hospital, has adopted my method of treatment, and neither of us has thus far lost a single case of erysipelas, although many very advanced cases have been sent to us, completely exhausted, and with gangrenous destruction of the skin of entire arms and lower thighs.

The treatment is a combination of several factors, the object of which is, on the one hand, a repression of the development and of the extension of the globular bacterium, and, on the other, the support of the resisting power of the organism, the activity of the heart, by stimulation and an easily digestible diet.

To obtain the first result, those parts of the skin which are affected already by erysipelas are rubbed, by means of the finger or a little sponge, every three hours with a mixture of carbolic acid and oil of turpentine (1:10), but *very gently*; the skin in the neighborhood, however, more energetically. The whole district rubbed is then covered with a soft linen compress moistened with concentrated lead water (1:100), and finally the parts affected already by the disease are again covered, outside of this compress, by thicker linen cloths dipped in ice water and lightly wrung out, or by a bladder of ice.

The external enveloping compresses with ice water are changed as often as they begin to grow warm.

The head or a whole extremity may be thus covered with ice-water compresses; lesser affected surfaces on one level may be covered by the ice bladder, which requires a less frequent renewal.

Internally, the patient takes lemonade or a weak solution of chlorate of potassa, to alleviate the accompanying stomato-pharyngitis and prevent diphtheritic depositions, and every one or two hours a teaspoonful of strong wine, to support the action of the heart.

In very rare cases, accompanied by excessive adynamia, a few doses of camphor were exhibited.

For the relief of pain and the limitation of the exudative process, a subcutaneous injection of morphia (0.005-0.01) is made morning and evening in the vicinity of the parts affected.

Regular operations of the bowels are induced by cold-water clysters or castor oil.

The subjective condition of a patient under this treatment is quite endurable, for he lies the whole time in a light doze, almost without pain.

Objectively, we notice, on the places which have been rubbed, at first increased redness of the skin, which extends more and more, under the successive inunctions, over the previously healthy skin surrounding the erysipelatous patch, frequently producing vesiculation and loss of epidermis.

This artificial erythema of the previously healthy skin is easily distinguished from the erysipelatous district, since in the periphery of the former there is wanting the oedema of the skin which accompanies the erysipelas.

We next observe a dryness and shrivelling of the epidermis of the erysipelatous patch, as if this had been slightly tanned. This condition soon extends outwards, over the surrounding territory, although less in degree.

In the course of twenty-four to forty-eight hours, the exudative process is cut short, as is manifested by a somewhat abrupt fall in the temperature of the skin and in the frequency of the pulse. This is the signal to desist from the inunctions, though the lead-water compresses around and outside of the erysipelatous patch may be continued for one day or more.

When this treatment has been pursued, we have never seen a relapse.

If the erysipelatous process extends itself beyond the time stated, it is the fault of the attendant, and no such case has occurred in our experience since we impressed this fact upon our hospital nurses.

Finally, I must remark that the use of tar, as recommended by Prof. Hueter, is based upon these same principles.

Where I have employed tar, the desired result has been less speedily obtained than by my own method, possibly because the tar, from its consistence, is less thoroughly taken up by the skin than the more fluid oil of turpentine, impregnated with carbolic acid.

Tar is also less well adapted for use upon the scalp, especially in the case of ladies, than my solution, in which the oil of turpentine conceals almost entirely the smell of the carbolic acid.

Above all, I hold that the use of tar alone, without the simultaneous employment of cold, is insufficient for the speediest possible cutting short of the process.

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**A HINT FOR THE POLICE.**—By order of the Prefect of Police in Paris, large tablets, comprising the elementary precepts of aid to be given to the sick and wounded, are to be suspended in all the police stations of the city, in order to avoid errors in confounding the insensibility of apoplexy, &c., with that of drunkenness, and to prevent mistakes in immediate proceedings before the doctor can arrive.—*London Medical Record.*

## Progress in Medicine.

### REPORT ON PUBLIC HEALTH.

By GEORGE DERBY, M.D. Harv.

#### STATISTICS OF HEALTH AND OF POPULATION.

SOME of the most valuable results of sanitary research are expressed in figures, and they are often of appalling extent. The average mind shrinks from the attempt to collate and digest them. The enthusiasm of a student of this department of science is needed to carry him through such a wilderness in pursuit of useful knowledge.

Attempts have been often made to reduce these statistical results to a form which would arrest attention, and give at once the more striking conclusions.

All readers are familiar with the tables or plans representing, by waving or diagonal lines, the course of the epidemics, variations of temperature, and many similar subjects. Straight lines, and cones and blocks, are also used in school geographies to show the comparative length of rivers and height of mountains.

Some recent attempts to express in a simple way the results of statistical research are very successful. The Census Bureau at Washington has just issued a series of small charts of the territory of the United States, each of which is colored so as to show at a glance the comparative condition of the population in certain respects in 1870, the year of the ninth census. Each chart has its own color, and each color has four or five degrees of intensity. We have thus represented to the eye, in a very striking way, 1st, the density of population ; 2d, the distribution of the foreign population ; 3d, of the colored population ; 4th, of the Irish ; 5th, of the English and Welsh ; 6th, of the Swedish and Norwegian ; 7th, of the German ; 8th, of the British American ; 9th, of the Chinese. There are, also, charts showing the illiteracy and wealth of the Nation, the one based on the inability to read and write, and the other on the returned value of property with reference to population. Still another shows in the same way the acquisition and transfer of territory from 1780 to 1870. All these charts are beautifully made, and will be found exceedingly useful.

The "Annales d'Hygiene" for 1871 contains statistical charts, prepared by Dr. Bertillon, which show the comparative mortality of infants in different parts of France, and also plans illustrating, by means of lines, and rectangles of different sizes, the comparative mortality of married and unmarried persons of both sexes, and at all ages, in France, in Paris, in Belgium, and in Holland. The general result of this latter inquiry goes to confirm the deductions made some years ago by Dr. Stark in Scotland, and makes very clear the fact that the married of both sexes live longer than the unmarried.

It has, however, been suggested, and we think with much reason, that the married are "selected lives"—health being one of the important elements of sexual attraction and selection.

#### RECEPTION OF CERTAIN POISONS DURING SLEEP.

A writer in the London *Medical Times*, puzzling over the indubitable fact that sewer men and "night cart" men are not so liable to suffer from

the specific poisons of the materials with which they have to deal as we might expect, suggests that possibly the body is more ready to receive these poisons *during sleep*, and may repel them during waking hours.

This idea seems well worth keeping in mind by physicians, to be proved or disproved by careful observation. The proclivity to take malarial fevers *by night* on Southern plantations may be remembered in this connection.

#### THE DEODORIZATION AND UTILIZATION OF ANIMAL REFUSE.

Mr. S. P. Sharples, State Assayer, read a paper on this subject before the "American Academy of Arts and Sciences" in Boston, January 29th, 1873, and permits us to make the following extracts: After alluding to the great interest which is now shown to exist in America in the utilization of the blood and offal of slaughtering establishments as fertilizers,\* and the numerous patents which have lately been secured for its accomplishment, three new processes are described.

The first of these is purely mechanical, and does not call in the aid of chemistry. It is in use in the extensive pork-packing establishment of Messrs. Charles North & Co., at East Cambridge. Mr. Squires has also just introduced it, and it is to be used at the new abattoir at Brighton.

The apparatus is known as "Hogel's dryer." It consists of a horizontal cylinder furnished with a steam jacket. Through the axis of the cylinder is passed a steam-pipe which is divided longitudinally in two semi-circular parts; one of these serves as an induction pipe and the other for the exhaust. This pipe is so connected with a series of arms that the steam passes out through one arm, and into the exhaust through the next arm, the arms being connected with each other by circumferential pipes. This axial pipe, with its connecting arms, is revolved by suitable gearing.

All parts of the animal that cannot be packed, including the head and entrails, which are previously washed, are put into large steam digesters and heated for some time under a pressure of 40 or 50 pounds per inch. This completely disintegrates the bone and tissue, and allows the fat and grease combined with them to rise to the top of the water contained in the tank. During this rendering, considerable quantities of offensive hydrocarbons, mixed, perhaps, with some phosphide and sulphide of hydrogen, are given off. These it is proposed to conduct into the ash pit of the furnaces employed for heating the boilers. To escape from here, they will have to pass through three or four inches of incandescent coal, and by this they will be decomposed and rendered inodorous. After the rendering is finished, the bone and scrap are removed from the digester (the grease and soup having previously been drawn off) and placed in the dryer. The blood of the animals slaughtered is now added and the machine set in motion. In the course of a few hours the whole mass is reduced to a dark-red powder, interspersed with fragments of bone, which are, however, very friable. The product is then run through a revolving sieve to separate the coarser portions which are then ground by a suitable mill and again mixed with the fine portion. The gases escap-

\* Labor is so expensive (at least in the Northern and Western States) as to forbid the extraction of albumen from the blood of animals.

ing from the dryer are treated in the same manner as those from the rendering tank.

This process appears to be very advantageous to those employing it. There are, however, some objections to its use. When the dryer is opened to remove its contents there is a very strong smell of roast meat from the hot dust. It is not profitable, or hardly even possible, to dispose of the "soup"\*\* in this manner, as the gelatine is very difficult to dry, and moreover it soon clogs up the machine, sticking fast to everything it touches when it becomes nearly dry. The ordinary "soups" from rendering animal refuse contain only about five or six per cent. of solid matter, not more than one or one and a half per cent. of this being nitrogen.

The fertilizer produced by this process is especially valuable for the nitrogen that it contains; the phosphoric acid being almost entirely in the form of tricalcic phosphate. Analysis gave:—

Phosphoric acid,	12.15
Nitrogen,	7.89
Water,	10.22

At the price at which this dust is sold at present it is the cheapest source of nitrogen.

Col. J. J. Storer, of Boston, has patented a process for using the refuse, that may be employed when fuel is plenty, and it is not a special object to save as much as possible of the animal matter. It consists of a modification of his well-known reverberatory furnace. The material to be desiccated is placed upon the sole of the furnace, and all gases arising from it are at once consumed in the upper portion of the furnace. He claims to be able to dispose of all the soup by this process. An average of two analyses of the fertilizer produced gives:—

Nitrogen,	3.09
Phosphoric acid,	13.63
Water,	7.13

This, as in the former case, is chiefly valuable for the nitrogen it contains. But it is not in as readily available a form as in the previous case, as it has been over-heated, and is mingled with considerable animal black.

The third and last method to be mentioned is that of Mr. Wilson. This is a natural outgrowth of the manufacture of the "Rumford Yeast Powder." It is in use at Brighton, at the establishment of Mr. Geo. Upton. The scrap from the digesters and also the soup are utilized here. The gases from the tank are burnt by first passing them through five hundred feet of iron pipe, heated to redness in order to superheat the steam, and then introduced, when mixed with the proper amount of air, into the furnace by which the coil is heated.

The process consists in treating the scrap and soup with a very acid phosphate of lime made from the refuse char from the sugar-houses. This is done in tanks lined with lead and having coils of lead pipes in the bottom, by which the contents of the tanks are boiled. This produces an exceedingly valuable fertilizer. When the material is first removed from the tank it is in the form of a stiff paste. This,

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\* This is the technical name given to the thin and watery portion, which is neither grease nor scrap.—(REPORTER.)

by exposure to the air and by crystallization, becomes at length so dry that it can be handled. A specimen dried at 100° C. gave an analysis:—

Water,	6.62
Soluble phosphoric acid,	15.57
Insoluble     "     "	3.19
Nitrogen,	1.69
Sulphate of lime,	50.49

together with bone char, &c.

This process, however, is not free from objection. It makes no provision for disposing of the blood conveniently. It is not as free from disagreeable odor as a perfect process should be. When the bone char is being acted upon by the sulphuric acid, there are always more or less disagreeable acid odors given off.

It also depends on a full and constant supply of refuse bone-black. A failure of a few days in the supply involves the establishment at once in difficulties.

None of the processes that I have mentioned can be considered as perfect, but they are all decided improvements upon those which for years have rendered the slaughtering establishments of great cities such a nuisance."

#### SLAUGHTERING OF ANIMALS.

A writer in the London *Med. Times and Gazette*, June 29th, 1872, thinks that the *rigor mortis*, which gradually comes on as the meat cools, prevents putrefaction by allowing the juices to "set," and preventing the mixture of the alkaline blood with the acid juice of the flesh.

In the neighborhood of Boston (and we think nowhere else), the carcasses are hung up in huge ice-houses or refrigerators, and there kept for many days. This is a great advantage in summer, both to the butcher and consumer, as experience has shown that freshly killed meat is (comparatively) unpalatable, and we are inclined to think that it is also less wholesome.

The practice of our Brighton butchers tends to confirm the observation of the English writer. They have found it essential to let the *rigor mortis* have its full effect and all animal heat disappear from the meat before placing it in the ice-houses, where the uniform temperature is about 40° Fahrenheit.

#### THE SEWAGE QUESTION.

This is the most prominent sanitary question now under examination in England, and many costly experiments are being tried by private companies and municipalities in the endeavor to turn sewage to profitable account without danger to public health. We have a large number of printed documents relating to this important subject, but refer the reader for its general discussion to the fourth report of the State Board of Health of Massachusetts, now in press.

The following sentence which we quote from a recent writer in the London *Medical Times and Gazette* well and briefly expresses the object of all efforts in this direction:—

"As life involves the conversion of food into sewage, so science must convert sewage into food, and deal with it so as to make the earth fertile, the air pure, and the water sweet."

## VENTILATION OF WORKSHOPS.

Dr. J. H. Stallard, at the Leeds Sanitary Congress, proposed a plan for ventilating workshops by means of a false ceiling of oiled paper, or of zinc with abundant perforations, and having between this false ceiling and the real ceiling a space in free communication with the outer air on all sides. Through the operation of the law governing the diffusion of gases, this plan, he thinks, would afford air of great purity. The suggestion is certainly ingenious, but would be applicable only to one-story workshops, or to the story next the roof. It would also be impossible to warm such a workroom in weather like that of Massachusetts in mid-winter.

## SMALLPOX.

At a meeting of the Epidemiological Society in London, Nov. 12th, 1872, it was stated by the President, with regard to smallpox, that the epidemic was widely diffused in 1871 and 1872, and had been present in Europe and Africa from south of the equator to the Arctic Ocean; in Asia from Southern India to Siberia; in America from Chili to Canada.

## BRAIN-WORK AND BRAIN-WORRY.

From this text has proceeded much profitable hygienic discourse of late in some foreign journals. The conclusion reached is this:—brain-work is conducive to health and longevity, while brain-worry causes disease and shortens life. The truth of the statement, and its application to what we see around us, is evident enough; yet it is well that such subjects should be continually discussed. Intellectual labor, although severe, like that performed by the judges of our highest courts, or by scholars and persons devoted to literary pursuits, if unmixed with excitement, and followed with regularity, is seen to promote bodily health and long life. On the other hand, mental cares, attended with suppressed emotions, and occupations which from their nature are subject to great vicissitudes of fortune and constant anxiety, break down the lives of the strongest. Every one has seen a class of men whose early mental training was deficient, and to whom the writing of memoranda was irksome, engaged in middle life in great undertakings, and taxing the memory with a mass of complicated business accounts, simply because they could more easily remember than write. Their power of memory for a certain kind of facts is often truly astonishing, but the strain is at last too much and they die before their time. The brain-worry of our school children might furnish useful illustrations of the truth of the same general proposition, but we forbear.

AIR AND RAIN. By Robert Angus Smith, F.R.S. London: Longmans, Green & Co. 1872.

Whoever has had occasion to study air in its sanitary relations, of late years, has been led of necessity to burrow among the heaps of "blue books" issued by the British Government in order to find the original investigations of Dr. Angus Smith. And the more they have been studied, the more evident it has become that here, indeed, are found not only the most exact results of modern science, to whose pursuit a long life has been devoted, but that their interpretation and practical application have been also presented in a philosophical, scholarly and perfectly intelligible way.

These various studies and reports which have been pursued under public authority, together with occasional papers read before scientific societies, have been recently collected and published by Dr. Smith, with many new reflections and conclusions. A volume called "Disinfection" appeared two or three years ago, and now we have "Air and Rain." This book is invaluable to all who are interested in sanitary science. No one before Dr. Smith has made such examinations of the constituent parts of the atmosphere in its natural condition, or of the various inorganic and organic substances which are mingled with it, or of the changes which they all undergo. His experiments in the "lead chamber" are simple in their conception and most instructive in their results. To him is due the clear demonstration of the direct influence on vitality of very minute changes in the proportions of oxygen and carbonic acid. Mingled with the history of experiments in mines and buildings, which are given with singular clearness, we find reflections upon ventilation, the germ theory of disease (with an able analysis of the views of Liebig and Pasteur concerning decomposition and fermentation), and hints and conjectures enough on these and cognate subjects to give direction to the studies of another generation of workers like himself, if fortunately they should appear. The fairness, breadth, and thorough honesty of Dr. Smith's mind are no less remarkable than its acuteness. Speaking of the persistency of some theorists on ventilation in demanding absolutely pure air at any cost, he says: "The chemical action of the human body demands warmth first above all things. No function can go on without it. You may live for hours, days or years, in badly ventilated places with more or less discomfort and danger, but a draught of cold air may kill like a sword. Such a universal instinct must not be sneered at."

There are many similar passages with regard to the sense of smell, the instincts of mankind in all ages, fortified by passages from early writers who used only their natural senses, which, coming from one devoted to exact science and who has greatly extended its boundaries, have unusual force. Finally, there are chemical and philosophical reflections on the influence of soils and climates which are full of suggestions of the deepest interest.

HEALTHY HOUSES. By William Eassie, Civil Engineer. London : 1872.

This is an exceedingly useful hand-book, in which may be found a great deal of information concerning the hygiene of dwellings, illustrated by several hundred wood-cuts.

The author is concise, and eminently practical, giving the trade price of every appliance which can enter into house construction.

Although the book is specially designed for English readers, it will be equally useful in this country, and it is quite remarkable to observe the familiarity of the author with the peculiarities of house building in the United States, and with American inventions.

TREATMENT AND UTILIZATION OF SEWAGE. By W. H. Corfield, Prof. of Hygiene, Univ. College, London. Second Edition. Macmillan & Co. 1871.

This volume is already well known in the United States, and must inevitably be sought for wherever the subject to which it relates is under investigation.

It puts in convenient form the abundant materials which were previously buried in Government Reports, presents the arguments on both sides of many disputed points, and finally sums them up with great ability.

**A MANUAL OF PRACTICAL HYGIENE.** By E. A. Parkes, M.D., F.R.S. Third Edition. London: 1869.

This is not a new book in the date of its publication, but in the search for exact information on every subject connected with public health it is the fountain of knowledge to which physicians and sanitarians must constantly resort. The resources of this invaluable treatise are made apparent when, after years of use, we find that it never fails to throw light on any hygienic question which may be proposed.

This volume and Tardieu's "Dictionnaire d'Hygiène" are the highest authorities for general reference on sanitary subjects. Dr. Parkes's Manual is furnished to the medical officers of the United States Army, and should be accessible not only to all physicians, but to the Boards of Health of our cities and towns.

**LEÇONS ELEMENTAIRES D'HYGIÈNE.** Par V. Cornil. Baillière. Paris: 1873.

The Minister of Public Instruction (M. Jules Simon) has ordered a course of instruction in hygiene to all classes of philosophy and mathematics in the schools and colleges of France, and special divisions of the subject are prescribed.

The little volume of which the title is given above is an attempt to furnish a text-book for this purpose. It is not only unsuccessful, but cannot fail to bewilder any young person ignorant of anatomy and physiology.

**Die STAUBINHALATIONEN KRANKHEITEN UND DIE VON IHNEN BESONDERS HEIMGESUCHTEN GEWERBE UND FABRIKBETRIEBE.** Von Dr. Ludwig Hirt. Breslau: 1871.

The present work forms the first of a proposed series, which have for their object the consideration of the diseases of the laboring classes. The author elaborates a subject which has been under investigation for many years by most distinguished scientists. The general plan of the work is to show the connection of cause and effect which exists between the inhalation of dust, of various kinds, and certain internal affections, with the view of avoiding the ill effects so far as possible. Affections of the heart and abdominal organs sometimes occur, though those of the respiratory organs are most frequent and most important. Statistical results are obtained from analyses of cases treated at different hospitals throughout Europe, the results being obtained from over seventy occupations, in which there is greater or less exposure to the inhalation of dust.

He shows that, while in the laboring classes, thirty-five per cent. of the internal affections are cases of catarrh, pneumonia, phthisis, &c., among those whose work exposes them to a dusty atmosphere fifty to sixty per cent. and even more expresses the ratio of frequency of diseases of the respiratory organs.

The mechanical irritation produced by the inhaled particles induces a *catarrhal* condition, which, in most instances, is the origin of the other and more serious affections, pneumonia, &c., though the latter

arise independently in exceptional cases. In some instances, a catarrhal affection of the respiratory organs occurs in fifty per cent. of the cases, chronic bronchial catarrh being most frequent, tracheal catarrh coming next in order, and laryngeal catarrh occurring still less frequently. According to his tables, vegetable dust is the most common origin of catarrhal affections, while metallic, animal and mineral forms are less frequently the cause in the order named.

If the chronic bronchial catarrh is allowed to progress, and proper measures are not taken in the way of direct or indirect isolation of the patient, there results, in not a few instances, the condition known as *emphysema* of the lungs. It is estimated that, on an average, one in eight or ten becomes the subject of this affection, though in some occupations, e. g., with stone-cutters, common laborers and scavengers, the percentage of cases of emphysema differs but little from that expressing the relative frequency of chronic bronchial catarrh. Emphysema appears to be the effect, most frequently, of the inhalation of mineral dust, less often of vegetable dust, while metallic and animal dust afford about an equal percentage and less than the other forms. Particles which occasion direct violence to the mucous membrane and lung tissue are not concerned in its development so much as those which are removed with difficulty in consequence of their minuteness and irregular shape. Usually it is the result of preexisting catarrh. While some may express doubts as to the connection of cause and effect between the inhalation of dust and the development of emphysema, there is more reason for questioning the connection of the so-called "nervous asthma" with the same cause, since it remains undecided whether this affection is due to a paralysis of the bronchi, innervation in the muscles, to an abnormal irritable condition of the vagus, or if it is to be considered, always, as a symptom of a disease of the lungs or heart. Nevertheless, it is a well-known fact that it is not uncommon for the inhalation of ipecac, new-mown hay, &c., to induce an immediate attack of spasm of the bronchi, asthma, &c.

The primary catarrh sometimes leads to *dilatation of the bronchi*, *bronchiectasis*, though its occurrence is no more and no less frequent with the operatives in question than with others. Occasionally, it is the result of ulceration of the bronchial mucous membrane, produced by the violent action of inhaled sharp particles.

*Inflammation of the lungs* occurs not merely as the result of pre-existing chronic catarrh, but may be induced directly by the inhalation of dust, the former being the case most frequently. In proof of the occurrence of primary pneumonia, a case is cited (p. 16) which came under the author's personal observation, where a boy had seven attacks of pneumonia after longer or shorter intervals; they were not preceded by any chronic catarrhal condition, and were directly traceable to the effects of the dust which he inhaled in a cotton factory where he was employed. Dust composed of vegetable matter appears to be more liable to produce pneumonia. Animal dust is almost equally dangerous; next in order comes metallic, and finally mineral dust. Exceptions, however, to these relations are frequent. Pneumonia is more frequent with the operatives in question than with others. Statistics show that, in a hundred patients who have been exposed to dust, 7.4 per cent. are affected with pneumonia, while in 100 others not so exposed (tanners, barbers, brewers, tailors, &c.), only 4.6 are so

affected. The comparatively high percentage furnished by tanners might deceive one, but it should be borne in mind that they are exposed very much to cold and dampness, the most frequent causes of pneumonia. The locality of the disease, in the case in question, differs from that in ordinary cases. While in the latter the lower lobes are affected thrice as often as the upper, the reverse is true of the former. Upon anatomical grounds, the right lung should be affected most frequently, though statistics are wanting to determine whether this is actually the case or not.

*Phthisis non-tuberculosa.*—Aside from the influence of other causes in the production of phthisis, the agency of the inhalation of dust in producing the same result has not been lost sight of by numerous writers. While the theories of Laennec in respect of the nature and origin of phthisis were admitted, the connection of cause and effect in question would not hold. Since, however, it is now admitted that phthisis, in the majority of cases, does not consist in a new-formation in the lung-tissue, but, rather, is induced by a chronic inflammatory process in the same, the above connection is no longer obscure. In fact, Niemeyer's exposition of the origin of phthisis is accepted and the author then finds an easy solution of his problem. He says, chronic irritation gradually induces chronic inflammation. Although, at first, the system may be in a condition to withstand, for a time, the injurious effects, still it must soon succumb because, as a result of the bronchial catarrh, the respiratory movements become so modified that the particles of dust more rapidly, more readily and in greater number, enter the bronchi and reach the alveoli where they finally set up a marked inflammatory condition.

He shows that phthisis is more common among those exposed to dust than with others. The disposition is found to be increased with those whose occupations require a continual sitting posture. On the other hand, if the occupation allows a change of position and free respiration, the disposition to phthisis is diminished in no slight degree. Indeed, in some instances, the diminution is so great that such operatives furnish a less percentage of phthisis than others who are not exposed to dust, but who are compelled to restrict themselves to a constant sitting posture and a strained position; e. g., blacksmiths and locksmiths in one class, and shoemakers in the other.

In a hospital at Breslau, from 1859–1869, and one at Würzburg from 1859–1865, 12,647 workmen, whose occupations had exposed them to the inhalation of dust of various kinds, were treated for internal affections, and of these, 1,936 or 15.3 per cent. were affected with phthisis. On the other hand, of 1,110 workmen who had not been so exposed, 153 or 13.7 per cent. suffered from the same disease.

Comparison of the death-rate, also, shows that in 100 dust-breathing workmen a larger number die from phthisis than in 100 others who have not been subject to the same influence. Neuville (*Lebensdauer und Todesursachen 11 verschiedener Stände und Gewerbe*. Frankfurt a. M. 1865), in his statistics, gives more than 300 deaths from phthisis in 1000 from all causes among dust-breathing operatives. Perron (*Annales d'Hygiène*, 2 Ser. t. 16, 1861, p. 70) found that among watchmakers, 60 per cent. die of phthisis. The author's tables do not comprise a very large number of cases and, therefore, are less valuable. He found 47.8 per cent of deaths from phthisis in 763 deaths among

dust-breathing workmen, while of those who had not been exposed to dust, only 38·6 per cent. died from this disease. Among the harness makers 76·9 per cent., wood turners 66·6 per cent., glaziers 63·6 per cent., common laborers 42·2 per cent., cabinet makers 46·0 per cent., carpenters 36·6 per cent., &c. of the deaths were due to phthisis. On the other hand, among coopers only 7·6 per cent., tailors 34 per cent., shoemakers 44 per cent. were due to the disease in question.

From an examination of table IV. (p. 30) it will be seen that the different kinds of dust produce varied results in the way of inducing phthisis. These results differ somewhat from those obtained by other observers; e. g., Lombard (*Annales d'Hygiène, &c.*, t. xi. 1834) & Beniston de Châteauneuf (*Annales d'Hygiène*, t. vi. 1831). The relative duration of life among dust-breathing workmen, as given by the author, coincides pretty nearly with the results furnished by Lombard, who, placing the average duration of life in the working classes at 56 years, found that among those exposed to metallic dust the average length of life was 51·1 years; among those inhaling mineral dust, 52 years; vegetable dust, 51·4 years; animal dust, 57·5 years; giving an average of 53·5 years for all dust-breathing workmen. The author's averages are as follows, in the same order: 53, 49, 52 and 54 years (vide general table). They differ, however, again, in the results as to the effects of animal and vegetable dust respectively. While Lombard found that the former appeared to be least dangerous in the way of inducing phthisis, the author finds that the disease occurs most rarely among those who inhale vegetable dust. They agree, however, in the main, in showing that dust composed of organic matter is least dangerous. Exceptions are not infrequent, as will be seen in the case of workers in brass, in slate and serpentine quarries, with whom the average length of life is somewhat more than the mean duration of life in the industrial classes.

Again, the author finds that while, on the average, 22·5 per cent. of dust-breathing patients are affected with phthisis, only 11·1 per cent. of those not exposed to dust are similarly affected. His results, however, are not to be considered as absolute, for other considerations are to be taken into account which might change the relations.

In the second section of this part of the book, the author considers at length the specific internal diseases which are said to be induced by the prolonged inhalation of special forms of dust. These are embraced under the general term, "pneumoconiosis," and comprise, so far as investigations have been made up to the present time, the following:—

1. Anthracosis, the result of the introduction of coal dust into the lungs.

2. Siderosis, the result of the introduction of iron dust into the lungs.

3. Chalcosis, the result of the introduction of silicious dust into the lungs.

Note.—The introduction of argillaceous earth into the lungs has been observed once by Merkel (*Zur Casuistik der Staubinhalationskrankheiten. Dtsch. Archiv. f. Klin. Med. Bd. viii. p. 206 et seq. 1871*).

4. Tabacosis, the result of the introduction of tobacco dust into the lungs.

5. Lyssinosis, the result of the introduction of cotton dust into the lungs.

GENERAL TABLE I.—Showing the effects of Inorganic Dust on Respiratory Organs in different Occupations.

INORGANIC DUST.	I. Metallic Dust.	Of 100 treated for internal affections among	Were affected with						Mortality among those treated.
			Phthisis.		Chronic bron- chitis.		Emphysema.		Pneumonia.
			pr. ct.	pr. ct.	pr. ct.	pr. ct.	pr. ct.	pr. ct.	
	Iron.	File cutters.	62.2	17.4	—	—	12.2	91.8	31.5
		Sewing needle grinders.	69.6	—	—	—	—	69.6	—
		Grinders (in general).	40.4	17.0	—	—	2.1	59.5	26.1
		Locksmiths.	11.5	9.2	2.6	5.8	29.1	15.0	
		Farriers.	10.7	9.8	0.5	6.6	27.6	10.5	
		Sieve makers.	42.1	10.5	—	15.7	68.3	—	
	Copper.	Instrument, tool grinders.	12.2	13.2	3.7	3.2	31.3	9.2	
		Engrav's (Formstechern).	36.9	39.4	—	10.5	86.8	—	
		Brass (bell) founders.	31.2	9.3	—	15.9	56.4	—	
		Engravers (Graveuren).	26.3	15.7	5.2	10.5	57.7	—	
		Braziers.	19.7	13.2	—	9.5	41.4	10.0	
		Tin workers.	14.1	18.4	1.5	4.9	38.9	9.0	
		Coppersmiths.	9.4	17.0	3.7	3.7	33.8	9.0	
		Lithographers.	48.5	13.5	8.0	5.4	75.4	—	
	Lead.	Manuf. of brazen articles.	—	—	—	—	—	—	(?)
		Watchmakers.	36.5	19.4	2.4	4.8	63.1	23.2	
		Printers.	21.6	15.6	2.9	5.2	45.3	12.2	
		Colorers.	25.0	9.3	—	6.2	40.5	12.5	
		Glaziers.	17.8	19.3	1.8	3.6	42.5	13.3	
		Glaziers.	25.0	4.4	7.3(?)	—	36.7	14.9	
		Painters.	24.5	20.7	2.8	2.8	50.8	17.9	
	Zinc.	Typefounders.	34.9	4.4	—	17.6	56.9	—	
		Workers with sulph. zinc.	6.0	12.0	1.0	6.0	25.0	—	
		Those exposed to inhalation of metallic dust.	About 28	About 15	About 3	About 7	About 53	About 15	
	2. Mineral Dust.	Agate polishers.	—	—	—	—	—	—	
		Fresco painters.	19.0	6.7	2.4	7.5	35.6	15.6	
		Cement workers.	8-10	15-17	(?)	4.0	27-31	—	
		Diamond cutters.	9.0	—	40.0	—	49.0	—	
		Flint-stone workers.	80.0	—	—	—	—	—	
		Plasterers.	—	—	—	—	—	—	
		Masons.	12.9	10.4	6.5	4.4	34.2	11.0	
		Millstone makers.	40.0	—	—	—	40.0	—	
		Workers in porcelain.	16.0	15.0	4.0	5.0	40.0	—	
		Porcelain turners.	—	—	—	—	—	—	
		Sandstone workers.	—	—	—	—	—	—	
		Slate quarriers.	—	—	—	—	—	—	
		Slate makers.	—	—	—	—	—	—	
		Serpentine workers.	—	—	—	—	—	—	
		Stone cutters.	36.4	8.0	8.7	8.7	61.8	21.5	
		Potters.	14.7	14.7	2.9	5.3	37.6	12.8	
		Those exposed to inhalation of mineral dust.	About 25	About 11	About 9 (?)	About 6	About 51	About 16	

GENERAL TABLE II.—Showing the effects of Organic Dust on Respiratory Organs in different Occupations.

ORGANIC DUST.	Of 100 treated for internal affections among	Were affected with							Mortality among those treated.
		Phthisis.		Chronic bron- chitis.		Emphysema.		Pneumonia.	
		pr.	ct.	pr.	ct.	pr.	ct.	pr.	
I. Vegetable Dust.									
Coal.	Modellers (Formern).	—	69·0	17·3	—	86·3	—	—	
	Coalheavers, &c.	2·0	12·4	8·1 (?)	14·4	46·9	—	7·0	
	Coal miners.	0·8	16·4	0·9	4·7	22·8	—	—	
	Chimney sweepers.	6·5	22·2	2·6	10·5	41·8	—	9·0	
Tobacco.	Tobacco manufacturers.	36·9	16·6	4·3	2·9	60·7	—	20·4	
Cotton.	Cotton “	10·0	—	—	—	10·0	—	—	
Flax.	Flax workers.	—	—	—	—	—	—	—	
Hemp.	Weavers.	25·0	30·7	3·2	11·1	70·0	—	—	
Wood.	Rope makers.	18·9	12·6	5·4	5·4	42·3	—	9·0	
	Cabinet makers.	14·6	10·1	3·9	6·0	34·6	—	11·8	
	Carpenters.	14·4	6·5	6·9	6·9	34·7	—	10·6	
Madder.	Wheelwrights.	12·5	9·2	1·3	5·2	28·2	—	11·2	
Meal.	Madder, workers in.	—	—	—	—	—	—	—	
	Bakers.	7·0	10·9	1·9	8·5	28·3	—	8·4	
	Millers.	10·9	9·3	1·5	20·3	42·0	—	13·2	
	Confectioners.	11·6	8·0	3·3	8·0	30·9	—	15·0	
	Those exposed to inhalation of vegetable dust.	About 13	About 19	About 5	About 9	About 46	About 12		
2. Animal Dust.									
Wool.	Cloth makers.	7·10	6·8	2·4	3·0	18·22	—	—	
	Cloth shearers.	10·4	12·3	12·3 (?)	8·3	43·3	—	10·4	
Hair.	Brush makers.	49·1	28·0	—	7·0	84·1	—	13·9	
	Hair dressers.	32·1	17·8	3·4	10·7	64·0	—	—	
	Harness makers.	12·8	7·5	2·5	5·0	27·8	—	15·4	
	Tapestry hangers.	25·9	11·7	2·5	10·3	50·4	—	14·3	
	Furriers.	23·2	10·7	2·7	8·1	44·7	—	12·0	
Bone.	Hat makers.	15·5	6·7	4·7	5·6	32·5	—	11·1	
	Turners.	16·2	9·3	1·8	5·6	32·9	—	16·8	
	Button makers.	15·0	25·0	3·0	7·0	50·0	—	—	
Horn.	Workers in horn.	15·0	—	—	—	—	—	—	
	Those exposed to inhalation of animal dust.	About 20	About 14	About 3	About 7	About 44	About 13		
3. Mixed Dust.									
Glass.	Glaziers.	17·8	19·3	1·8	3·6	42·5	—	13·3	
	Glass grinders.	35·0	25·0	3·0	7·0	70·0	—	—	
Rags.	Glass pulverizers.	—	—	—	—	80·0	—	—	
Manure and streets.	Paper makers.	—	—	—	—	—	—	—	
	Common laborers.	15·1	11·0	10·7	7·6	44·4	—	18·5	
	Those exposed to inhalation of mixed dust.	About 23	About 18	About 5	About 6	About 52	About 15		

The occurrence of one or another of these affections has been a subject of discussion from the time of Joannes Bubbe (1721), if not from an earlier period. The last to doubt their occurrence were Förster and Friedreich, who maintained the pigment nature of the particles said to be found in the lungs. Zenker, however (*Tageblatt der 40 Versammlung deutscher Naturforscher und Aerzte in Hanover, 1865.* Nr. 5, p. 66 and *Ueber Staubinhaltionskrank.* Deutsches Arch. f. Klin. Med., 1867, Bd. ii. p. 115), is believed to have proved the fact of the occurrence of anthracosis, and even by the analogy postulated by Friedreich, of the penetration of oxide of iron into the lungs. Similar results have been obtained by Merkel. The recent experiments, also, of Slavinsky (*Experimentelle Beiträge zur Pneumoconioselehre.* Virch. Arch. iii., Heft 2, 1869) have shown that finely-divided particles, which enter the trachea and reach the alveoli and tissue of the lungs, enter the lymphatic glands and blood of animals.

The third affection, chalcosis, has been demonstrated by Meinel (*Ueber die Erkrankung der Lungen durch Kieselstaubinhaltung.* Erlangen, 1869) in 19 autopsies, from the anatomical appearances and chemical examination of the lungs. The results of microscopical examinations were not so satisfactory, still they showed the difference between the effects produced and those of pneumonia and phthisis.

In regard to tabacosis, only two cases have been observed by Zenker, and therefore the grounds are insufficient for an absolute opinion as to the connection of cause and effect. Experiments upon rabbits have led to no results in the way of settling this point.

The fourth affection, which A. Martens (1836) described as "pneumonie cotonneuse," is considered at length. The author finds that, except from analogy, it cannot yet be included in the same category with the preceding affections. In case, however, this analogous disease does occur, he takes exception to the term applied to it by Martens and suggests lysinosis.

Considered together, these affections are found to present much in common : they are characterized as generally chronic, and always successors of the inhalation of dust ; their diagnosis, frequently unwarranted during life, is established only after death ; the pathological appearances consist in evidences of chronic inflammation and in deposits of particles of dust in the lung tissue, such as were inhaled during life. Deviations and modifications of these appearances, of course, occur. Are they, then, independent affections ? Considering the post-mortem appearances, they may be termed such, but, taking their chemical history, prognosis and etiology alone into consideration, they lose their independent character, and must be considered as modifications of the familiar affection known as "chronic disseminated pneumonia".

In the next part (or Part II.) of the book, the author considers the various occupations which are concerned in producing the various affections which have been discussed in the preceding pages. They are classified, according to the kind of dust which they develop, into those which occasion metallic and mineral or inorganic dust, and vegetable and animal or organic dust. Different effects, also, are shown to be produced when the dust is composed of sharp and pointed particles and when of blunt and rounded particles. A clear idea of this portion of the subject may be obtained from a study of the annexed general table.

The third and final part of the book treats of the methods suggested and the measures adopted for the purpose of diminishing, as much as possible, the danger ensuing from exposure to the inhalation of the various kinds of dust. He remarks upon the defective knowledge which is apparent, the world over, in regard to the diseases which have been considered, in their relation to the various occupations; he advocates more thorough and extended investigation into these relations, suggests the passage of more stringent laws governing the management of factories and the like; maintains the propriety of medical supervision of them, with the view of preventing individuals from engaging in occupations which will be likely to jeopardize their health, and of limiting the age in which individuals shall be allowed to follow certain occupations, and of prevailing upon operatives to use such precautions against the evil effects of the dust developed in their occupations as are known to be of avail.

The measures which are adopted consist in the most complete isolation of the operative from the dust to which he is exposed, and in counteracting the injurious effects of whatever dust may be inhaled.

In the way of isolation, recourse is had to many expedients by various operatives; sponge moistened with water or solution of potash, cotton wool, flax, gauze, thin oiled masks, and wearing a moustache, are mentioned as affording some protection. Special apparatuses, *e. g.* Paulin's, Brizé-Fradin's aspiration tube, &c., have been constructed, by means of which the operator is enabled to inhale fresh air free from dust. But these are objectionable on many grounds. The various decoctions, &c., employed with the view of averting the evil effects of the different forms of dust, he considers of no avail. The best measures of prevention he considers under two heads:—

1. Reduce to a minimum the amount of dust in the different occupations.
2. Effect, as far as possible, the rapid and complete removal of the dust, when formed, from the apartment in which the occupation is carried on.

In order to effect the first, various methods are to be employed, including sprinkling the floors, collecting the dust in proper receptacles, covering the machines with some material, &c.

The second object is attained by various methods of *ventilation*, which should be employed to remove the dusty atmosphere and introduce fresh, uncharged air for respiration. This object is gained in two ways—called *natural* and *artificial* ventilation—the first being effected by means afforded by nature in the differences of temperature, and the second by means of special apparatus, ventilators. The efficiency of the first depends upon laws which regulate the passage of air through a chimney, the rapidity being, within certain limits, proportional to the difference of temperature between the inner and outer atmosphere. He states that the natural ventilation is imperfect; first, because it cannot be employed except under certain circumstances, and, second, because it is not powerful enough to effect the removal of particles of dust. A combination of the natural and artificial methods is employed sometimes with advantage. This consists in establishing an artificial current by means of heat. The purely artificial method consists in forcing fresh air into an apartment by means of engine-power. In the construction of this apparatus, special precautions are necessary. The

power applied should be strong enough to insure a constantly thorough change of the atmosphere of the apartment. The locality from which the fresh air is obtained should be as far as possible from that in which the dusty atmosphere is expelled. The entrance of air into, and its exit from the rooms to be ventilated, should be so arranged that the current will pass across the machines, or source of the dust. The engine is employed to produce the revolution of a "fan," by means of which a current is produced, whereby the fresh air is carried through a conduit made for the purpose, and leading to an apartment to be ventilated. The revolution of the fan produces, in the first place, corresponding movements in the surrounding air, but at the same time a centrifugal force manifests itself. If, now, the fan is completely shut in, the pressure of the air will not be everywhere the same; it will be greatest at the circumference. Taking advantage of this fact, the air is admitted to that portion of the fan nearest the axis, while its exit is made to take place through an opening at the circumference. In some instances the circumstances are reversed, the fan is made to produce a current directly from the machines to the outer air, in which cases the air from the dusty apartment first enters tunnels placed over the machines, or openings made beneath the same; it then passes through conduits, and is admitted to the axis of the fan, whose revolutions produce a current by which the dusty air passes out through an opening at the circumference. Various other modifications are employed to suit special cases. There are many occupations, however, in which methods have not yet been ascertained for insuring a proper isolation of the operatives. The author proposes that governments should offer prizes for the invention of machines or methods for accomplishing this object.

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UNEQUAL DILATATION OF THE PUPILS AN AID IN DIAGNOSIS.—(*Arch. de Physiol.*, Jan.-Feb., 1872).—Dr. F. Rogue, after a series of prolonged observations made upon children, has come to the following conclusions with regard to the unequal dilatation of the pupils in unilateral affections of different organs:—

1. In many affections of the lungs, and also in case of swelling of the bronchial glands, as well as of the glands of the pericardium, the pupils are unequally distended.
  2. The enlarged pupil corresponds to the affected side.
    - a. When both sides of the body are affected, the more widely dilated pupil corresponds to that side upon which the inflammatory process is the more recent.
    - b. In cases of inflammation of both lungs, as well as that of the bronchial glands, the more widely dilated pupil corresponds to the side of the affected glands.
    - c. If an affection of the right lung is complicated with pericarditis, the right pupil is the more widely dilated.

This phenomenon is explained by one of the more recent discoveries of Claude Bernard, viz., that the irritation of certain nerves of sensation conveys a shock through the spinal cord to the radial muscular fibres of the iris, causing the contraction of these fibres and the consequent dilatation of the pupil. It may not be unreasonably inferred that analogous changes of the pupil accompany other unilateral affections in different portions of the body.

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THE capital trial which has recently been held in this city, and which has so largely excited the attention of the public, both on account of the shocking circumstances of the murder and the remarkable nature of the so-called expert or scientific testimony given in connection with it, can scarcely be called exceptional in the latter respect; it is only an addition to the disgraceful record of criminal law in this country, the legitimate fruit of its established processes. It needed not the Wharton trial in another city to point to the possibility of a similar occurrence when occasion offered at home; it could have been predicted as inevitable by those at all familiar with the history of medico-legal cases in our courts. As long ago as 1867, this JOURNAL called attention to the subject of medical testimony, in words which might be repeated here, as pertinent in the present case, as they have been in other criminal trials in Massachusetts since they were first written.

The relations of this case and trial to legal medicine can be very briefly stated. A man had been killed and cut up, and the Government endeavored to show, in part by the presence of blood-stains upon woodwork and clothing, that the deed was done by the accused and in his stable. The defence admitted that the stains were blood-stains, but maintained that they were the blood of a horse and were several weeks old. The murder had been committed only two or three days before the stained articles were in possession of the Government. The questions to be determined, therefore, were: The age of the stains, and from what animal was the blood derived? The first was either of easy or well-nigh impossible solution, as the case might be; the second was matter for the judgment of one well acquainted with the microscopic appearances of blood under all circumstances, trained to accurate observation with the microscope, and experienced in similar investigations. It was to be determined only by direct comparison of the blood in question with that of man and of the horse under the most varied conditions. The judgment formed upon such special investigations, upon previously acquired knowledge, and upon the recorded opinions of other competent observers, should have been given to the court with entire impartiality, without reserve and only for the sake of justice. The statements made should have satisfied the defence, as well as the prosecution, that the conclusions were fair to both alike. Such testimony is received in the spirit with which it is given, by coun-  
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sel, jury and court, and its influence upon the case is seldom disturbed by the introduction of conflicting and necessarily one-sided evidence in reply.

What was the nature of the testimony offered to the jury, and what the character of the so-called experts who were allowed to testify in this case? Without taking as reliable representation all that the various newspaper reports give us, we may fairly accept certain portions of them, in which all agree, as correct. First, the chief government witness, upon whom the responsibility rested of giving to the jury the whole truth with regard to the probable age and nature of the blood-stains, did not state clearly the exact state of dryness or freshness of the materials when placed in his hands for examination; nor does it appear that he gave the absolute measurements of the corpuscles, as obtained by the micrometer, in any one of the many specimens submitted to him. He is represented as giving only their relative size as compared with those of the horse. He did make a positive statement that science could show that the blood-stains were not those of a horse, and the very loose and silly assertion that the differences in the blood-corpuscles of man and horse were as distinct as "corn and peas." Worse than this, he alluded to the apparent sameness of the blood of the stains upon the clothing of the accused and that of the murdered victim on comparison, and, although he stated that he didn't mean to say they were identical, he repeated the statement without qualification when speaking of the blood upon the stall, saying that it was "the same as that of Mr. Ellis." Such allusions are dangerous in the extreme, in spite of their absurdity, for the statement might leave a stronger impression of individual relationship upon the jury than the qualification could remove. They must also materially lighten the efforts of the defence to show the incompetency of the government expert, and cast discredit upon other conclusions presented by him, perhaps warranted by the circumstances of the case. No statements were made concerning the piece of flesh given him for examination, although it might have contained blood-corpuscles in perfectly unchanged condition, and gone far to establish the freshness of the *corpora delicti*, upon which the credibility of the conclusions offered by the government so largely depended.

With this element of uncertainty in the evidence as left by the prosecution, the course of the defence was plainly indicated, and it was not necessary to be particular in the selection of the agents to accomplish their object. With the wide latitude allowed by the court, as to the qualifications of an expert, it is always easy to find those that suit. Indeed, the wilder and more unreliable the testimony elicited from such parties the better, if in flat contradiction to the statements of government witnesses, for not only is the desired doubt thus thrown

upon the results of their special investigations and conclusions, but the jury can hardly avoid the conviction that all so-called expert or scientific evidence is utterly worthless. There can be no doubt of the success of the defence in this direction. If the testimony on the part of the government was culpably weak and unwarranted in the extent and positiveness of its conclusions, many of the statements offered in opposition to them on the other side were as bad or worse; some of them were outrageous. To think of the Supreme Court of Massachusetts allowing a person to give testimony as an expert on blood corpuscles, who confessed that he had never measured them, that he had never compared those of man with those of the horse, who didn't even know the shape of a corpuscle, and who stated that if a globule were magnified 800 diameters it would only look as large as a fine "pencil point on paper"! After this it is not surprising that a witness was also permitted who talked about 10,000 diameters as a power to be used in connection with the examination of blood-stains; or that the court should have been led to reject the important and correct statement offered in rebuttal by the government that differences in the size of corpuscles can be satisfactorily determined by a power of 400 diameters; or that it interfered to accept as a qualified expert on the histological character of suspected muscular tissue a person who was admitting at the time that he had never studied anatomy or medicine regularly, and was stating that the microscopical examination of human flesh is a "part of physiological chemistry."

It is needless to multiply these incidents of a trial which every one speaks of as a disgrace to our State. To this general verdict we assent, but we are far from attaching the largest portion of it to the professions of medicine or science. The daily journals have come out in the character of scientific critics, and discuss the expert testimony with an assurance and positiveness quite equal to that they so freely condemn in the witnesses on the stand, but they have little to say of the remarkable management on the part of the government of the evidence at its command, of some of the rulings of the court, and of the imperative need of reform in the administration of our criminal law. For ourselves, we see no shadow of disgrace resting upon medicine or true science from this trial. They have, and offer, competent and fair-minded observers, but if the government select, and the court approve, others to investigate and pronounce judgment in such important matters, if they allow such trifling with questions of life or death, they alone are responsible, upon them lies the disgrace.

Sifted from all this confusion of contradictory statement of opinion and bungling presentation of evidence, as given to the jury, what conclusions do the probable facts of the case warrant? Can the blood of the horse be distinguished from that of man? It was positively,

though tardily, stated that some of the blood-stains were soft and flexible, and were apparently but a few days old, and that the bits of flesh found in the stable were "fresh and raw like raw meat." There is reason to believe that this opinion concerning their freshness could have been sustained by other and competent witnesses, had they been called. If this were so, we believe it would have been possible, by measurement and by direct comparison, to determine with strong *probability* the nature of the blood. We have reason to believe, even, that after drying, the corpuscles of the horse may be distinguished from that of man in many cases. We do not believe, however, that, ordinarily, any opinion, of so positive a character as by itself to warrant a conviction in capital cases, can be expressed.

The result of the trial, although foreseen by those who were acquainted with the conduct of our courts in cases involving medical and scientific testimony, has produced a strong impression upon the community, and should be made the occasion of such reforms as the administration of justice demands. 1st. The initial processes in capital cases should be so altered that the choice of the chemist, anatomist, or microscopist, upon whom rests the whole subsequent responsibility of investigating and testifying as expert, shall not be left to any police agent or coroner who may first get possession of the *corpora delicti*, but shall be determined by the Attorney-General or the Supreme Court. 2d. No person should be admitted by the court to give testimony as an expert, until he has proved his fitness for the situation by a proper education, by sufficient practical experience, and by a past record unsullied by exhibitions upon the witness-stand of gross ignorance or wilful perversion of scientific knowledge. 3d. The executive officers of the State should exercise great discretion in conferring scientific titles which carry with them a seeming warranty of high professional merit, and retain the power of taking them away for unworthy conduct or conspicuous ignorance.

How such reforms are to be accomplished, it is not easy to see. Three years ago, in view of these evils, the American Academy of Arts and Sciences and the Suffolk District Medical Society appointed a committee to consider the subject of expert testimony, and through their chairman, Hon. Emory Washburn, a bill was presented to the Legislature. It was referred to the judiciary committee, but was never heard of afterwards. The chairman of the committee on the part of the Medical Society presented a report of its views on the subject, which was published in this JOURNAL of Feb. 17th, 1870, and which we commend to the re-perusal of our readers. Had some of its judicious suggestions been adopted, the State might have prevented this last disgrace to the administration of justice.

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## Correspondence.

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### THE LATE DR. MARSHALL.

MESSRS. EDITORS.—Will you favor many of your readers and old subscribers in New Hampshire by publishing the following obituary notice of one of our best men:—

Died at Mason Village, now Greenville, N. H., Dec. 16th, 1872, Hon. Thomas Hastings Marshall, M.D., aged 66. He died of softening of the brain, after a confinement of only a few weeks from his accustomed business. Some months previous, he was thrown from his carriage, and his head was injured; and there had been noticed, from this time to his last sickness, a gradual decay of his memory and some impairment of his mental powers. He nevertheless kept on with his business till his strength became exhausted. He said to me, in a visit I made to him in the early part of his sickness, no doubt from a consciousness of the failure of his memory, "When I am practising my profession I do not know but that I can go on and do just as well as I ever did; it all follows, as a matter of course and habit. My forgetfulness does not in the least disable me from making as good a prescription as ever." This was in keeping with the judgment and good common sense of the man.

During his last sickness he was delirious most of the time, and, occasionally, he would become furious, requiring force to restrain him; but at length he sank, exhausted by his severe muscular action and imperfect nutrition.

Dr. Marshall did not have the advantage of a collegiate education, but was well fitted at the Academy at New Ipswich in such classical studies as are required to enter upon his professional course; and ever after in his life, unlike too many of our profession, who will not write, or are really incompetent, he was always ready to write on any subject or occasion, in which he could be useful, and was able, too, to do it in a scholarly manner. He commenced his studies with the late Luke Howe, M.D., of Jaffrey, and, during his pupillage, besides attending the medical lectures at Bowdoin and Dartmouth, he took one or two private courses with Prof. R. D. Mussey, M.D., LL.D., at Hanover. He ever after kept up a correspondence with this distinguished man, which was continued even when Dr. Mussey's physical strength was so impaired that he was obliged to employ an amanuensis.

Having graduated at the Dartmouth Medical College, Hanover, in 1835, he commenced practice at Fitzwilliam, but remained only for a short time, when he removed to Mason Village in September, 1837, where he spent the remainder of his life. One of his sons was the first in the town to enlist in the War of the Rebellion, and did not leave the service till, by exposure and hardships, he lost his health, which has never yet been regained.

Dr. Marshall was an active and working member of the New Hampshire State Medical Society, and always attended the annual meetings, if possible, and participated in all their proceedings. He often prepared papers for these meetings, which have appeared in the published transactions of the same. He was also a member of the American Medical Association.

He took a deep interest in agriculture, both practically and scientifically, and became a member, and was often chosen the President, of the Agricultural Societies of his County. No one could be more desirous than he to infuse into the business of farming a thorough, practical and scientific spirit, and to elevate to its proper standing this first of all pursuits.

He also held many civil offices, always being ready to serve the community to the extent of his power, in town matters, in the schools, in the church, &c. He served twice as a Representative from Mason Village to the New Hampshire Legislature, and was also chosen Senator for two years, to the same.

It must be mentioned, to his credit, that he espoused the antislavery cause early, when it was exceedingly unpopular, and boldly sustained it when it cost much to do so, even to the loss of much of his business, discarding a rigid and narrow conservatism, which would impose shackles upon his free opinions. It was enough for him to know that it was right, and thus being convinced, he left consequences to take care of themselves. But with all his devotion and loyalty to the best interests of the community, he yet made all these various matters in which he was interested and enlisted subservient to his profession; this was first and last to him as long as he lived.

The death of Dr. Marshall has been followed with the deep regret and sorrow of a large circle of friends and patrons. Those who knew him best loved him most. He was always the true man, the man of principle, of integrity and uprightness. He ministered to all alike; the sick and suffering poor received the same attention as the rich, if the case demanded it, although he knew that his services would never be remunerated in the slightest degree. He never thought of his profession in any venial point of view; it was to him a mission of mercy and safety to mankind. He could not conceive of the sordidness of the man who only thinks of dollars and cents in the practice of medicine.

All his life he devoted himself to his profession, never letting anything usurp its place; giving up all his social enjoyments, all his comforts of domestic life, all his own business and cares, to his medical duties. Nothing but ill health ever deterred him from his place, and this very rarely, although he was of rather a slender constitution, and often worked when others would have stopped, so anxious was he always to be in the line of his duty.

Dr. Marshall was a good, reliable and scientific practitioner. He had little of that hurry and despatch that characterizes so many physicians, but was always slow and deliberate in making up his mind; but when his opinions were once formed, whether in medicine or on other topics, they were reliable and worthy of confidence. In diagnosis he was generally very correct, and needed rarely to review or reform his decisions. He never made pretensions to any uncommon acuteness, but chose rather to have dulness and ignorance imputed to him, in his careful, plodding, examining, comparing and thinking, before he decidedly avowed his opinions. But he had rarely to retract his diagnosis, when his decision had been thus obtained. He had but little regard for that popular pathology and even diagnosis that most always prevails with those around the sick; he thought for himself, and if he could not direct the opinions of others, he, at least, scorned to be swayed from the right by what he knew was the result of mere caprice.

He was much esteemed as a surgeon in his locality, and was eminently successful in this part of his practice. He met all his cases of this kind with confidence, and performed many of the severer operations in surgery with entire success.

Dr. Marshall was careful and judicious in the administration of medicine, and discriminating in selecting his remedies; he knew what he wanted to accomplish, and chose his agents accordingly. He kept himself well posted in all the progress of his profession to the day of his death. He was a subscriber and reader of this JOURNAL all through his professional life. He made himself acquainted with all the new discoveries in our art; he was familiar with all the new remedies, and used them early and freely in his practice. He was a reading and reflecting man—he thought for himself and made up his own opinions.

He did not live to his profession alone, caring for nothing else; he was ready to aid in any useful project in the community; he was always a supporter of the institutions of religion, a warm friend and worker for the schools, an ardent advocate for the cause of temperance, and all measures tending to advance and elevate the public sentiment. He strove in every way to do his whole duty as a man, a Christian and a physician, and he leaves a blessed memory behind him.

A. S.

## Medical Miscellany.

OUT of 3,665 women delivered during the past year under the auspices of the Royal Maternity Charity, there were only four deaths.

AT the meeting of the Suffolk District Medical Society, last Saturday evening, a committee was appointed to devise and report some scheme by which the much needed reform in the matter of expert testimony may be realized. This action of the Society grew out of the pseudo-scientific exhibitions in the recent Alley trial.

TRUE to his loyalty to the medical art [science?] the late Lord Lytton, in a document addressed to his legal representatives, stipulated that after death, or presumed death, his body should lie untouched three days on the bed on which he died, and that thereafter medical men should examine him to ascertain if he were really dead; and, if so, to certify accordingly. The profession will see with satisfaction that his Lordship will receive the honor of interment in Westminster Abbey.—*Lancet*, Jan. 25.

**STREET ACCIDENTS IN PARIS.**—Forty-five thousand carriages circulate in the streets of Paris, including 1,200 omnibuses, 8,000 private carriages, 10,000 public cabs and hired carriages, and 25,000 carts for transport. These carriages, it is stated, kill yearly 135 persons, and wound 1,200.

THE *Pall Mall Gazette* has the following from a medical correspondent:—

The medical education of women will shortly be placed upon a solid foundation in the city of Boston, U. S. A., by the New England Female Medical College being made a branch of Harvard University. Among the great Universities of the New World, Harvard is well known as the oldest, the wealthiest, and the most celebrated, so that no reason for complaint will remain to English speaking people on the other side of the Atlantic when the medical degrees of Harvard are as accessible to women as to men.

We are greatly obliged to the *Pall Mall Gazette* for this interesting item of news. It is a bit of gossip that had not reached our ears, here in Boston.

AT a meeting of the Boylston Medical Society of Harvard University, held February 7th, the following was announced by the President to be the award of the Committee on the Boylston Prizes for the present year:—

First Prize to Thomas Morgan Ratch for an essay on "The Emigration of the White Corpuse in Inflammation." Second Prize to Walter Ela for an essay on "Fractures of the Elbow-joint."

THE effect of the energetic action of the new Board of Health on the small-pox epidemic is strikingly shown in the figures given by the *Boston Daily Advertiser*. We suspect the old board will be somewhat startled to see how easily the disease has been controlled by proper measures. It is, nevertheless, a result which was predicted over and over again last fall. The decline in the number of deaths for each week is indicated in the accompanying table. The last column indicates the decrease from the week preceding.

Week ended.	Deaths from smallpox.	Decrease.
December 21	69	
" 28	63	6
January 4	60	3
" 11	56	4
" 18	46	11
" 25	35	11
February 1	42	7*
" 8	24	18
" 15	17	7
" 22	8	9

\* Increase.

**CAUSE WHY.**—Dr. Aveling, in his recent work on "English Midwives," says (p. 157):—"Accoucheurs are only now preferred because they have been proven to possess greater skill, greater judgment, greater mildness, greater patience and greater decorum."

#### BOOKS RECEIVED.

**A Manual of Histology.** By Prof. F. Stricker, of Vienna, Austria, in co-operation with others. Translated by several gentlemen in London, Boston and New York. Edited by Albert H. Buck. New York: William Wood & Co. Pp. 1106, with 431 Illustrations. (From A. Williams & Co.)

**Fistula, Hæmorrhoids, Painful Ulcer, Prolapsus and other Diseases of the Rectum, their Diagnosis and Treatment.** By William Allingham. Second Edition, revised and enlarged. Philadelphia. Lindsay & Blakiston. 1873.

#### NOTES AND QUERIES.

"**FAULTS OF STYLE.**"—A reviewer of Dr. Tilbury Fox's work on "Skin Diseases" in the London *Lancet*, says:—"The following sentence may not perhaps excite surprise in the United States of America, but we confess to having been somewhat startled by it; 'I don't exhibit arsenic, because, for the life of me, I don't see the reason of giving it.'"

Perhaps not; because such phrases are peculiar to *England*, and such faults in style in *Englishmen* are too frequent to excite surprise in **AMERICA.**

**PEOPLE**, otherwise respectable, wear little bags of sulphur suspended from their necks as prophylactics; the Board of Health direct "disinfection of infected clothing, &c." by fumigation with burning sulphur—can any person give a sensible reason for resorting to either practice as a means of preventing the spread of smallpox?

**VESICLE.**

Do two positive bad smells—that of disease and carbolic acid—neutralize each other and produce a negative infection.

**MURRAY.**

**PAMPHLETS RECEIVED.**—Reports of the Superintendent and Trustees of the Butler Hospital for the Insane. Providence. 1873. Pp. 40.—Transactions of the Territorial Medical Society, at its Second Annual Meeting, held in Denver, Col., September, 1872. Denver. 1873. Pp. 34.—Report of the Pennsylvania Hospital for the Insane, for the year 1872. Philadelphia. 1873. Pp. 70.

**DIED.**—In Dorchester, 24th inst., Dr. Abner Phelps, aged 93 years 5 mos. 18 days; a member of the Massachusetts Medical Society since 1818.

#### MORTALITY IN MASSACHUSETTS.—*Deaths in Fifteen Cities and Towns for the week ending February 15, 1873.*

Boston, 150—Charlestown, 16—Worcester, 27—Lowell, 16—Chelsea, 12—Cambridge, 30—Salem, 9—Lawrence, 6—Springfield, 6—Lynn, 8—Fitchburg, 6—Newburyport, 4—Somerville, 10—Fall River, 16—Haverhill, 9. Total, 325.

**Prevalent Diseases.**—Consumption, 48—pneumonia, 41—smallpox, 26—scarlet fever, 17—diphtheria and croup, 14.

The deaths from smallpox were as follows:—In Boston seventeen, Charlestown six, Cambridge two, and Chelsea one.

**GEORGE DERBY, M.D.,**  
Secretary of the State Board of Health.

**DEATHS IN BOSTON** for the week ending Saturday, February 22d, 129. Males, 66; females, 63. Accident, 3—inflammation of the bowels, 1—bronchitis, 2—inflammation of the brain, 5—congestion of the brain, 3—disease of the brain, 5—cerebro-spinal meningitis, 1—cyanosis, 1—cancer, 1—consumption, 18—convulsions, 4—croup, 1—debility, 4—diarrhoea, 1—dropsy of the brain, 4—dysentery, 1—erysipelas, 1—scarlet fever, 8—typhoid fever, 2—disease of heart, 3—infantile, 1—intemperance, 1—disease of the kidneys, 1—inflammation of the lungs, 10—marasmus, 5—measles, 1—old age, 7—paralysis, 4—pleurisy, 1—pyæmia, 1—premature birth, 3—puerperal disease, 2—stricture of urethra, 1—spina binda, 1—smallpox, 8—disease of spine, 1—syphilis, 2—disease of stomach, 1.

Under 5 years of age, 48—between 5 and 20 years, 13—between 20 and 40 years, 30—between 40 and 60 years, 19—over 60 years, 19. Born in the United States, 98—Ireland, 22—other places, 9.